LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Oct. 6-Oct. 13, 2008.

New podcast on LLNL's iTunes channel

Lawrence Livermore National Laboratory now features a new video podcast on iTunes, with more clips on the way. The new clip features the Lab’s latest in radiation detection technology -- Adaptable Radiation Area Monitor (ARAM). ARAM has been commercialized and now is in use on various U.S. roadways.

It's easy to subscribe to the LLNL channel on iTunes, and automatically download new videos as soon as they are posted. iTunes is a free program for users of Macs and PCs, available as a download from the Apple Website. Once it is installed on your computer, you can easily access the LLNL iTunes channel page by searching for Lawrence Livermore National Lab in the iTunes store. Open the channel file and you will find podcasts on the Lab's work in global warming, detection technologies and energy research.

For more on Livermore's iTunes page, go to http://phobos.apple.com/WebObjects/MZStore.woa/wa/viewPodcast?id=286458989

New source of clean energy research appears in Sunday Telegraph

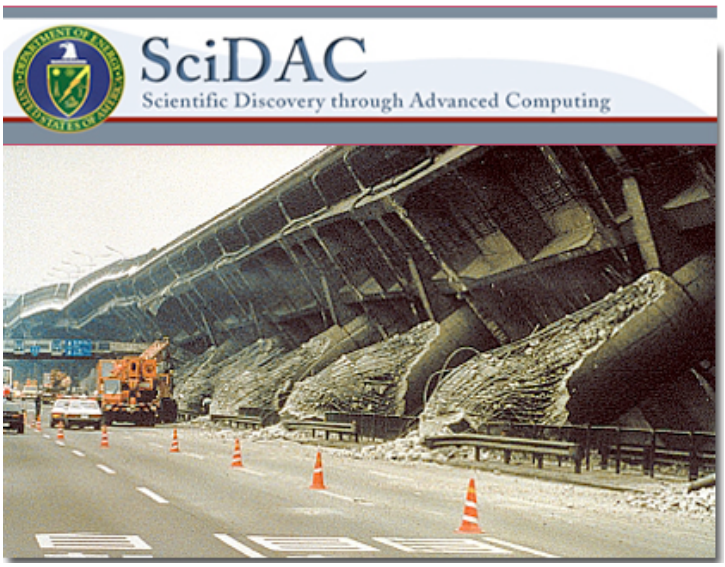
Telegraph.co.uk

Harnessing the power of the sun is no easy feat. But Livermore scientists are hoping to achieve that and more when the National Ignition Facility comes online next spring.

The Sunday Telegraph tackled NIF and the planned High Powered Laser Research (HiPER) facility in the United Kingdom and both groups' efforts to create a cheaper, cleaner source of electricity.

To read more, go to http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/10/05/scisun104.xml

Laboratory earthquake simulation work featured in SciDAC



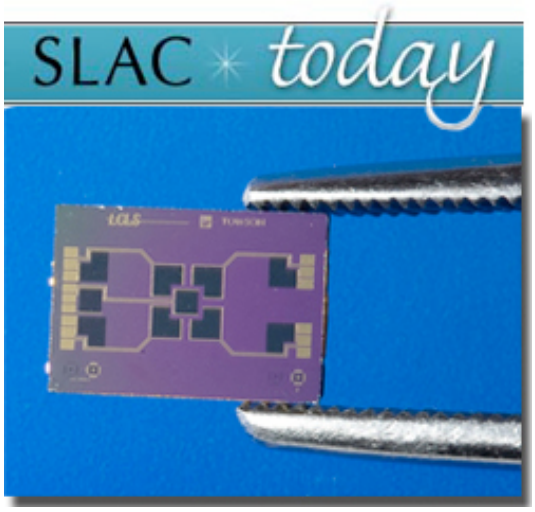
A major transportation structure, an elevated expressway, following the 1995 Kobe Earthquake in Japan.

David McCallen and Shawn Larsen discuss new supercomputing simulation capabilities that allow scientists to better understand the effects of earthquakes on buildings and complex structures in an article in the fall edition of *SciDAC Review.*

Entitled “Computational Predictions of Earthquake Motions and Responses of Major Structures,” the article examines the challenges of and opportunities for creating accurate High Performance Computing (HPC) seismic simulations by examining two case studies. The first looks at a virtual geophysics reconstruction of the Great San Francisco Earthquake of 1906, an effort focused on evaluating the ability of cutting-edge, high-performance geophysics models to inform us about the scientific aspects and hazard implications of that historically important event.

The second example demonstrates an end-to-end simulation that highlights the ability to simulate from fault rupture through to detailed structural response. Such end-to-end simulations, which employ the merging of geophysics and engineering, provide an important new tool to understand, and appropriately design, complex and expensive structural systems. To read the complete article, go to *SciDAC Review* http://www.scidacreview.org/0803/html/quake.html.

Lab engineer measures X-rays at SLAC



The LCLS total energy sensor will sit directly in the X-ray beam during commissioning to help calibrate diagnostic equipment. Photo by Brad Plummer.

Stephan Friedrich of LLNL's Physical and Life Sciences led a team at the Stanford Linear Accelerator (SLAC) to measure the level of X-rays in the Linac Coherent Light Source (LCLS).

LCLS will generate X-rays 10 billion times brighter than any source before it. Being the first of its kind, the LCLS has presented engineers with a number of unique technical hurdles. Measuring just how much punch the LCLS beam actually packs has proved especially challenging. But Friedrich's team has solved the problem with a tiny sensor designed to confront the beam head

To read more, see the *SLAC Today* article at http://today.slac.stanford.edu/feature/2008/lcls-sensor.asp

Drought or bounty?

Will the Great Plains experience another dust bowl similar to the one that blew through the region in the 1930s?

Groundwater depth has a significant effect on whether the Great Plains will have a drought or bountiful year. Recent modeling results show that the depth of the water table, which results from lateral water flow at the surface and subsurface, determines the relative susceptibility of regions to changes in temperature and precipitation.

"Groundwater is critical to understand the processes of recharge and drought in a changing climate," said Reed Maxwell of the Lab's Physical and Life Sciences Directorate, who along with a colleague at Bonn University analyzed the models that appear in the Sept. 28 edition of the journal *Nature Geoscience.*

To read more, go to http://www.nature.com/ngeo/journal/v1/n10/full/ngeo315.html

LLNL's Randy Pico honored as 'most distinguished' alumni

Randy Pico, of Engineering, was honored as one of five of DeVry University's "Most Distinguished" alumni over the university's 25-year history in California. He received his electronic technician diploma from DeVry in 1981, and returned to receive his bachelor's degree in technical management in 2004. Randy has served for many years as a DeVry advisory board member and has been a primary architect in establishing the relationship between LLNL and the university.

Latest edition of weekly *Newsline* available

NEWSLINE

Newsline provides the latest lab research and operations news. See the latest issue at https://newsline.llnl.gov

Photo of the week

Juno chop -- Debbie San Maria and Mike Haskell tend to the Tri-Lab Linux Capacity Clusters (TLCC) Juno and Minos supplied by Appro. The clusters are used by all three national defense laboratories -- Los Alamos, Sandia and Livermore. The new computers provide much needed "capacity" computing, running larger numbers of smaller jobs simultaneously on a single high-performance machine. Juno and Minos are some of the first Linux clusters.

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.

The Livermore Lab Report archive is available at: https://publicaffairs.llnl.gov/news/lab_report/2008index.html